Foreword

The exhiting discovery 25 years ago of the high ionic conductivity of beta-aluminas established the field of superionic conductors and opened a way to research and development of new high - energy battery systems based on these solid electrolytes.

The International Workshop on Beta - Aluminas and Beta Batteries held in Druzhba, Bulgaria, was organized by the Central Laboratory of Electrochemical Power Sources of the Bulgarian Academy of Sciences in association with the UNESCO Regional Office for Science and Technology for Europe. This meeting brought together academic and profesional people from all over the world and provided an international forum for the presentation, discussion and review of the scientific and technological status of this field.

More than 50 experts from 15 countries, representing different univesities, research centres and companies attended the Workshop. The papers presented, covering fundamental and applied aspects of beta-aluminas, are included in this Proceedings Volume.

A Workshop session was devoted to the mechanism and theory of the ionic conductivity as well as to the crystal structure, local ion arrangement and basic properties of beta-aluminas. Special attention was paid to the low-temperature behaviour of these materials. Very exciting was the session on the optical properties which revealed a new interestiong application field of beta-aluminas as a solid state laser host. Some new approaches to the preparation of improved beta-alumina ceramics were discussed. In a special battery session representatives of the world´s leading companies reviewed the present status of the development and commercialization of beta batteries. The possibilities for employing beta-aluminas in different sensors as well as in alkali - metal-thermoelectric converters (AMTEC) were also demonstrated.

I would like to express my sincere thanks to the UNESCO Regional Office for Science and Technology for Europe and to the Bulgarian Battery Compani "Akumulatori" for their sponsorship of the Workshop. Special thanks are due to the members of the International Advisory Board and to all colleagues at the Central Laboratory of Electrochemical Power Sources of the Bulgarian Academy of Sciences who helped me in the organization of this meeting.

I hope very much that the contacts between the participants and the discussions during the Workshop will be stimulating to our work and will generate new ideas for the fututr research in this highly interesting field of materials science and electrochemistry.

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